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TOXICITY OF VARIOUS INSECTICIDES TO THE IMPORTED FIRE ANT OCT 17 1966

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Plant Pest Control Division

Heptachlor, aldrin, dieldrin, and chlordane were shown to be effective as soil insecticides for controlling the imported fire ant (Solenopsis saevissima richteri Forel) by Blake et al.<sup>2/</sup> and Lofgren et al.<sup>3/</sup> However, use in the Imported Fire Ant Eradication Program was limited because of forage residues and potential hazards to wildlife. These problems made it necessary to exclude certain areas from large-scale treatment against this insect. As a result, a search was made for other insecticides that would adequately control the imported fire ant. This report presents results of tests conducted with various insecticides.

METHODS

The procedures used for the insecticide evaluations were described by Banks et al.<sup>4/</sup> Laboratory tests of candidate insecticides were made first at 10 p.p.m. in the soil. Materials giving more than 50-percent mortality of the imported fire ant at this level were then tested at 1.0 p.p.m. This procedure was repeated, reducing the concentration by tenfold increments, until a level was reached that gave less than 50-percent mortality after 96 hours.

Materials giving 90- to 100-percent mortality at 0.1 p.p.m. in the soil were considered promising for field testing against natural infestations of the imported fire ant. This criterion was used since this is the approximate toxicity of chlordane, the least effective of the commonly used insecticides.

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- 1/ Now with Entomology Research Division, Gainesville, Florida.
  - 2/ Blake, G. H., Eden, W. G., and Hays, K. L. Residual effectiveness of chlorinated hydrocarbons for control of the imported fire ant. Jour. Econ. Ent. 52: 1-3. 1959.
  - 3/ Lofgren, C. S., Adler, V. E., and Barthel, W. F. Effect of some variations in formulation and application procedure on control of the imported fire ant with granular heptachlor. Jour. Econ. Ent. 54: 45-47. 1961.
  - 4/ Banks, W. A., Lofgren, C. S., and Stringer, C. E., Jr. Laboratory evaluation of certain chlorinated hydrocarbon insecticides against the imported fire ant. Jour. Econ. Ent. 57: 298-299. 1964.

Of 118 insecticides evaluated in the laboratory for possible use as residual treatments against the imported fire ant, only about 10 percent showed sufficient promise to warrant field testing. The results of these evaluations are presented in table 1. The insecticides were classified as follows according to their toxicity, based on insect mortality after 96 hours:

Class

- I. Insecticides giving less than 50-percent mortality at 10 p.p.m.
- II. Insecticides giving less than 50-percent mortality at 1.0 p.p.m., but more than 50-percent mortality at 10 p.p.m.
- III. Insecticides giving less than 50-percent mortality at 0.1 p.p.m., but more than 50-percent mortality at 1.0 and 10 p.p.m.
- IV. Insecticides giving more than 50-percent mortality at 10, 1.0, and 0.1 p.p.m.

Results

Of the insecticides evaluated, 53 were in Class I, 33 in Class II, 16 in Class III, and 16 in Class IV. An untreated check was run in duplicate with each test. Average mortality in the untreated checks was 6.5 percent. The results of any test in which the check mortality exceeded 20 percent were discarded, and the materials were retested.

TABLE 1.--Toxicity of various soil insecticides to the imported fire ant, based on mortality after 96 hours.

Item No.	Entomology No. (ENT-)	Class I					Mortality at indicated dosage		
		Chemical name	Other designations--	1/	Percent	Percent	10 p.p.m.	1.0 p.p.m.	0.1 p.p.m.
1	20871	Acetaldehyde, 2-(2-ethoxyethoxy) ethyl 3,4-methylenedioxyphenyl acetal. . . . .							
2	13006	m-Acetotoluidide, <u>alpha, alpha</u> , <u>alpha</u> , <u>alpha</u> -trifluoro-. . . . .	Sesamex				3	-	-
3	16538	Benzenesulfonic acid, p-chloro-, p-chlorophenyl ester. . . . .	Overex				3	-	-
4	9624	Benzhydrol, 4,4'-dichloro- <u>alpha</u> -methyl-. . . . .	Dimite <sup>(R)</sup>				8	-	-
5	18596	Benzilic acid, 4,4'-dichloro-, ethyl ester. . . . .	Chlorobenzilate				8	-	-
6	25718	Bi-2,4-cyclopentadien-1-yl, decachloro-. . . . .	Pentac <sup>(R)</sup>				0	-	-
7	18066	Butane, 1,1-bis(p-chlorophenyl)-2-nitro-, and Propane, 1,1-bis (p-chlorophenyl)-2-nitro- (2 to 1 ratio). . . . .	Dilan <sup>(R)</sup>				43	-	-
8	24728	Carbamic acid, dimethyl-, 5,5-dimethyl-3-oxo-1-cyclohexen-1-yl ester. . . . .	Dimetan				5	-	-
9	24977	Carbamic acid, dimethyl-, tetrahydrofurfuryl ester. . . . .	Hercules AC-5199				40	-	-
10	25784	Carbamic acid, methyl-, 4-dimethylamino-m-tolyl ester. . . . .	Bayer 44646				3	-	-
11	25766	Carbamic acid, methyl-, 4-dimethylamino-3,5-xylyl ester. . . . .	Zectran <sup>(R)</sup>				15	-	-



Table 1.--Continued

Class I--Continued					
12	23969	Carbamic acid, methyl-, 1-naphthyl ester. . . . .	Carbaryl	40	-
13	25732	Carbamic acid, methyl-, <i>m</i> -(2-propynyloxy)phenyl ester . . . . .	Hercules 8717	20	-
14	25810	Carbamic acid, methyl-, <i>o</i> -(2-propynyloxy)phenyl ester . . . . .	Hercules 9699	8	-
15	25022-X	<i>p</i> -Chlorophenyl trichloromethyl disulfide-triethyl phosphite reaction product . . . . .	Monsanto CP-7768 (mixture of CP-7769 and CP 8810--equimolar)	8	-
16	21195	Chrysanthemic acid, 6-bromopiperonyl ester . . . . .		15	-
17	24654	Crotonic acid, 3-hydroxy-, benzyl ester, dimethyl phosphate. . . . .	Shell SD-4092	3	-
18	8379	Ethane, 1,1,1-trichloro-2,2-bis (3,5-dichloro-2-methoxyphenyl)-. . .		38	-
19	8373	Ethane, 1,1,1-trichloro-2,2-bis (2,5-dimethoxyphenyl)-. . . . .		33	-
20	8374	Ethane, 1,1,1-trichloro-2,2-bis (3,4-dimethoxyphenyl)-. . . . .		38	-
21	1716	Ethane, 1,1,1-trichloro-2,2-bis (p-methoxyphenyl)-. . . . .	Methoxychlor	46	-
22	23648	Ethanol, 1,1-bis(p-chlorophenyl)-2,2,2-trichloro-. . . . .	Kelthane <sup>(R)</sup>	0	-
23	24832	Glutaconic acid, 3-hydroxy-, dimethyl ester, diethyl phosphate . . . . .	General Chemical GC-3661	33	-
24	24833	Glutaconic acid, 3-hydroxy-, dimethyl ester, dimethyl phosphate . . . . .	General Chemical GC-3707	3	-
25	27002	4,7-Methanoinden-1-ol, 4,5,6,7,8,8--hexachloro-3a,4,7,7a-tetrahydro . . . . .	Velsicol 48-CS-34	13	-
26	27004	1,4-Methanonaphthalene-5,8-diol, 1,2,3,4,9,9-hexachloro-1,4-dihydro-. . . . .	Velsicol 48-CS-36	13	-

Table 1.--Continued

Class I--Continued					
27	15154	1,4-Methanonaphthalene-5,8-dione, 1,2,3,4,9-hexachloro-1,4,4a, 8a-tetrahydro-. . . . .	Velsicol 48-CS-73	8	-
28	25717	1,3,4-Metheno-2H-cyclobuta [cd] pentalen-2-ol, 1,1a,3,3a,4,5,5, 5a,5b,6-decachloro-2-(2,3,- dihydrohypropoxy) octahydro-. . .	Hooker HRS-1243	25	-
29	25274-X	Methyl sulfide (40 percent by volume in Deobase). . . . .		5	-
30	25767	4-Morpholineacetone nitrile, <u>alpha</u> - methyl-. . . . .	W-24 (Velsicol)	28	-
31	27054	2,5-Norbornadiene, 1,2,3,4,7,7- hexachloro-5,6-bis(chloromethyl)-	Hooker HB-8	13	-
32	25525	1-Oxaspiro [4.4] nona-6,8-diene, 2, 3,6,7,8,9-hexachloro-. . . . .	Velsicol 57-CS-41	13	-
33	38	Phenothiazine . . . . .		3	-
34	24044	Phosphonic acid, (dithiodimethylene) di-,tetramethyl ester . . . . .	Monsanto CP-8574	0	-
35	24695	Phosphonic acid, [(ethylthio) methylidynē] tri-, hexaethyl ester . . . . .	Monsanto CP-7769	20	-
36	24952	Phosphonic acid, [(ethylthio) (phenylthio)methylenē] di-, tetraethyl ester	Monsanto CP-12376	0	-
37	24951	Phosphonic acid, (mercaptomethyl idynē)tri-, hexaethyl ester, O,0-diethyl phosphorothioate . .	Monsanto CP-11447	28	-
38	25758	Phosphonothioic acid, (chloro= methyl)-, O-isobutyl ester, O- anhydride with diethyl phosphate.	Stauffer B-8778	5	-
39	24953	Phosphoric acid, 1-(dimethoxy= phosphinyl)vinyl diethyl ester. .	Monsanto CP-12432	18	-
40	24415	Phosphoric acid, 1-(dimethoxy= phosphinyl)vinyl dimethyl ester .	Monsanto CP-10502	0	-

Table 1.--Continued

## Class I--Continued

41	24978	Phosphoric acid, dimethyl (4-methoxycarbonyl-1-methyl-1- butenyl) ester. . . . .	Newphos No. 1	5	-	-	-	-
42	25568	Phosphorothioic acid, O,O- dimethyl S-[2-(methylsulfinyl)= ethyl] ester	Bayer 24498	0	-	-	-	-
43	24980	Phosphorothioic acid, O,O- diethyl S-2-(diethylamino)= ethyl ester, p-toluenesulfonate	Chipman-6200	0	-	-	-	-
44	24650-X	Phosphorodithioic acid, O,O- dimethyl S-(N-methylcarbamoyl= methyl) ester (46% soluble concentrate). . . . .	Dimethoate	5	-	-	-	-
45	25820	Phosphorodithioic acid, S-[2- (1,4,5,6,7-hexachloro-5- norbornen-2-ylmethylthio)-1- methylene] O,O-dimethyl ester . . . . .	Velsicol 58-CS-52	28	-	-	-	-
46	24653	Phosphorothioic acid, S-[(5- methoxy-4-oxo-4H-pyran-2-yl)= methyl] O,O-dimethyl ester. . .	Endothion Kryocide Super- Seventy (72 percent cryolite)	5	-	-	-	-
47	24984-X	Sodium hexafluoroaluminate . . .	Aramite <sup>(R)</sup>	3	-	-	-	-
48	16519	Sulfurous acid, 2-(p-tert- butylphenoxy)isopropyl 2- chloroethyl ester . . . . .		5	-	-	-	-
49	26184	Toluene, 4-chloro-alpha, alpha, alpha-trifluoro-3-nitro-. . . .		5	-	-	-	-
50	7422	m-Toluidine, alpha, alpha, alpha- trifluoro-. . . . .		28	-	-	-	-
51	25257	s-Triazine-2,4,6(1H,3H,5H)- trione, 3,5-dichloro . . . . .		0	-	-	-	-



Table 1.--Continued

## Class I--Continued

52	17193	s-Triazine-2,4,6(1H,3H,5H)-trione, 1,3,5-trichloro-. . . .	3	-	-
53	24950-X	Xanthic acid, (diethoxy=phosphinylmethyl) dithiomethyl-, ethyl ester . . . . .	33	-	-
		Monsanto CP-11901			

## Class II

54	25661	Carbamic acid, 2-(diethoxy=phosphinodithioyl)ethyl ester	Stauffer R-2968	95	0	-
55	19059	Carbamic acid, dimethyl-, 4-methyl-2-propyl-6-pyrimidinyl ester. . . . .	Pyramat <sup>®</sup> Hooker	70	43	-
56	25780	Carbamic acid, methyl-, 3,5-diisopropylphenyl ester. . . . .	HRS-1422	100	8	-
57	25726	Carbamic acid, methyl-, 4-(methylthio)-3,5-xylyl ester .	Bayer 37344	100	33	-
58	25763	Carbamic acid, methyl-, 6-chloro-m-cumenyl ester . . . . .	Hercules 7522-H	100	48	-
59	25736	Carbamic acid, methyl-, 6-chloro-3,4-xylyl ester . . . . .	Upjohn U-17004	100	28	-
60	21557	Chrysanthemumic acid, 6-chloro piperonyl ester. . . . .	Barthrin	100	15	-
61	21825	Chrysanthemumic acid, 3,4-dimethylbenzyl ester . . . . .		55	3	-
62	4225	Ethane, 1,1-dichloro-2,2-bis(p-chlorophenyl)- . . . . .	TDE	70	18	-
63	4221	Ethane, 1,1,1-tribromo-2,2-bis(p-bromophenyl)- . . . . .		98	3	-
64	15153	4,9:5,8-Dimethano-1H-cyclopenta[b] naphthalene, 5,6,7,8,11,11-hexachloro-3a,4,4a,5,8,8a,9,9a-octahydro-. . . . .	Velsicol 49-CS-53	65	48	-
65	23393	2-Norbornene, 5-(bromomethyl)-1,2,3,4,7,7-hexachloro-. . . . .	Shell SD-2774	100	28	-

Table 1.--Continued

## Class II--Continued

66	23394	2-Norbornene, 1,2,3,4,7,7-hexa=chloro-5-(chloromethyl)-. . . .	Shell SD-2801	100	3	-
67	23979	6,9-Methano-2,4,3-benzo= dioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide . . . . .	Endosulfan	100	8	-
68	27001	4,7-Methanoindan, 4,5,6,7,8,8-hexachloro-3a,4,7,7a-tetrahydro-	Velsicol 47-CS-116	100	10	-
69	27007	2-Norbornene, 5-[(allylthio)methyl]	Velsicol	100	0	-
70	20852	1,2,3,4,7,7-hexachloro-. . . . . Phosphonic acid, (2,2,2-trichloro=1-butyryloxyethyl)-, dimethyl ester. . . . .	52-CS-53	100		
71	19763	Phosphonic acid, (2,2,2-trichloro=1-hydroxyethyl)-, dimethyl ester	Butonate	85	5	-
72	25765	Phosphonodithioic acid, S-p-tert-butylphenyl,ethyl-, O-ethyl ester	Trichlorfon Stauffer N-3051	60	8	-
73	25757	Phosphonothioic acid, (chloro=methyl)-, O-isopropyl ester, O-anhydride with diisopropyl phosphate . . . . .	Stauffer B-8760	100	15	-
74	24969	Phosphoric acid, 2-chloro-1-(2,4-dichlorophenyl)vinyl diethyl ester. . . . .	Shell compound 4072 Bayer S 209 (22684)	100	5	-
75	24941	Phosphoric acid, 2-chloroethyl 2,2-dichlorovinyl methyl ester .		100	10	-
76	20738	Phosphoric acid, 2,2-dichlorovinyl dimethyl ester	Dichlorvos Hercules 3895	98	0	-
77	24729	Phosphoric acid, 2,2-bis(ethyl=thio) vinyl diethyl ester		100	13	-
78	24652	Phosphorodithioic acid, O,O-diethyl S-(isopropylcarbamoyl=methyl) ester		100	25	-
79	25705	Phosphorodithioic acid, O,O-dimethyl S-phthalimidomethyl ester	American Cyanamid 18682 Imidan <sup>(R)</sup>	85	3	-
				50	20	-

Table 1.--Continued

## Class II--Continued

80	24102	Phosphorodithioic acid, $\text{O}, \text{O}, \text{O}'$ , $\text{O}'$ -tetraethyl $\text{S}, \text{S}'$ --methylene ester. . . . .	Ethion	100	48	-
81	24954	Phosphorodithioic acid, $\text{O}, \text{O}, \text{O}'$ , $\text{O}'$ -tetraethyl $\text{S}, \text{S}'$ -thiodi- methylene ester. . . . .	Monsanto CP-13206	100	23	-
82	24689	Phosphorodithioic acid, $\text{O}, \text{O}$ - dimethyl $\text{S}$ -[2-(ethylsulfinyl) ethyl] ester. . . . .	Bayer 23453	100	35	-
83	17957	Phosphorothioic acid, $\text{O}$ -(3-chloro- 4-methyl-2-oxo-2H-1-benzopyran- 7-yl) $\text{O}, \text{O}$ -diethyl ester. . . . .	Coumaphos Monsanto CP-11549	100	3	-
84	24949	Phosphorothioic acid, $\text{O}, \text{O}$ -diethyl $\text{S}$ -2-propynyl ester. . . . .	Fenthion	98	13	-
85	25540	Phosphorothioic acid, $\text{O}, \text{O}$ -dimethyl $\text{O}$ -[4-(methylthio)-m-tolyl] ester.		100	25	-
86	17034	Phosphorothioic acid, $\text{S}$ -[1,2-bis- (ethoxycarbonyl)ethyl] $\text{O}, \text{O}$ - dimethyl ester. . . . .	Malathion	100	48	-

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## Class III

87	25500	Carbamic acid, methyl-, $\text{m}$ - isopropylphenyl ester. . . . .	Union Carbide UC-10854	100	58	35
88	23970	2,4-Dioxa-3-phosphabicyclo [4.4.0] decane, 3-chloro-5-methyl-3- thio- . . . . .	Union Carbide UC-8305	100	100	8
89	22377	2,7-Epoxy-3,6-methanooxireno [2,3- b] naphthalene, 3,4,5,6,9,9- hexachloro-1a,2,2a,3,6,6a,7,7a- octahydro- . . . . .	Shell 52-RL-71	100	100	48
90	27040	1,3,4-Metheno-2H-cyclobuta [cd] pentalen-2-ol, 2-acetamido-1, 1a,3,3a,4,5,5,5a,5b,6-deca- chlorooctahydro- . . . . .	Hooker HRS-1362	100	70	30



Table 1.--Continued

Class III--Continued					
91	27006	2-Norbornene, 1,2,3,4,7,7-hexachloro-5-phenyl- . . . . .	Velsicol 49-CS-51	68	53
92	24399	1,4-Oxathiane-3-thiol, S-(O,O-diethyl phosphorodithioate). .	Hercules 2032	100	93
93	24585	Phosphoric acid, diethyl 2-(ethylthio)-1-methylvinyl ester . . . . .	Hercules 3004	100	33
94	24968	Phosphoric acid, 2-chloro-1-(2,5-dichlorophenyl)vinyl diethyl ester	General Chemical GC-3583	100	25
95	24967	Phosphoric acid, 1-(2,5-dichlorophenyl)-2,2-dichloro=vinyl diethyl ester . . . . .	General Chemical GC-3582	100	0
96	24586	Phosphoric acid diethyl 2-(methylthio)-1-methylvinyl ester . . . . .	Hercules 3653	100	18
97	25713	Phosphonodithioic acid, ethyl-, O-ethyl S-p-tolyl ester	Bayer 38156	100	10
98	25712	Phosphonothioic acid, ethyl-, O-ethyl O-(2,4,5-trichlorophenyl) ester	Bayer 37289	100	10
99	25754	Phosphonothioic acid, ethyl-, O-(2-chloro-4-nitrophenyl) O-ethyl ester	Stauffer N-2230	100	23
100	25715	Phosphorothioic acid, O,O=dimethyl O-4-nitro-m-tolyl ester . . . . .	Bayer 41831	100	38
101	25755	Phosphonothioic acid, ethyl-, O-(2-chloro-4-nitrophenyl) O-isopropyl ester . . . . .	Stauffer N-2404	100	8
102	25635	Phosphonothioic acid, methyl-, O-(2,4-dichlorophenyl) O=methyl ester. . . . .	Bayer 30911	100	18



Table 1.--Continued

Class IV					
103	15949	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1, 4,4a,5,8,8a-hexahydro- . . . .	Aldrin	100	100
104	16225	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-6, 7-epoxy-1,4,4a,5,6,7,8,8a= octahydro- . . . . .	Dieldrin	100	99
105	22376	5,8-Epoxy-1,4-methanonaphtha= lene, 1,2,3,4,10,10-hexa= chloro-1,4,4a,5,8,8a-hexa= hydro- . . . . .	Shell 52-RL-45	100	100
106	8372	Ethane, 1,1,1-trichloro-2,2= bis(5-chloro-2-methoxyphenyl)-		60	63
107	15156	4,7-Methanoindan, 1,2-dibromo-4, 5,6,7,8,8-hexachloro-3a,4,7, 7a-tetrahydro- . . . . .	Velsicol 52-CS-64	100	98
108	25584	4,7-Methanoindan, 1,4,5,6,7,8, 8-heptachloro-2,3-epoxy-3a, 4,7,7a-tetrahydro- . . . . .	Velsicol 53-CS-17	100	100
109	17713	4,7-Methanoindan, 4,5,6,7,8, 8-hexachloro-1,2-epoxy-3a, 4,7,7a-tetrahydro- . . . . .	Velsicol 49-CS-56	100	80
110	27005	4,7-Methanoindan, 1,2,3,4,5,6, 7,8,8-nonachloro-3a,4,7,7a= tetrahydro- . . . . .	Velsicol 48-CS-104	100	90
111	25960	4,7-Methanoindene, 1-bromo-4, 5,6,7,8,8-hexachloro-3a,4, 7,7a-tetrahydro- . . . . .	1-Bromo= chlordene	100	100
112	25562	4,7-Methanoindene, 4,5,6,7,8, 8-hexachloro-1-fluoro-3a,4, 7,7a-tetrahydro- . . . . .	1-Fluoro= chlordene	100	100
113	15150	4,7-Methanoindene, 4,5,6,7,8, 8-hexachloro-3a,4,7,7a= tetrahydro- . . . . .	Velsicol 48-CS-99	100	58

Table 1.--Continued

Class IV					
114	15152	4,7-Methanoindene, 1,4,5,6,7,8, 8-heptachloro-3a,4,7,7a= tetrahydro- . . . . .	Heptachlor	100	100
115	27003	4,7-Methanoinden-1-ol, 4,5,6, 7,8,8-hexachloro-3a,4,7,7a= tetrahydro-, acetate. . . . .	Velsicol 48-CS-35	100	100
116	9932	4,7-Methanoindene, 1,2,4,5,6, 7,8,8-octachloro-2,3,3a,4, 7,7a-hexahydro- . . . . .	Chlordane	100	93
117	24880	4,7-Methanoisobenzofuran, 1,3, 4,5,6,7,8,8-octachloro-1,3, 3a,4,7,7a-hexahydro- . . . . .	Telodrin®	100	100
118	25719	1,3,4-Metheno-2H-cyclobuta-[cd] pentalene, dodecachloroocta= hydro- . . . . .	Mirex	100	50

1/ Mention of a proprietary product in this publication does not constitute a guarantee or warranty of the product by the US Department of Agriculture and does not imply its approval by the Department to the exclusion of other products that may also be suitable.

# INDEX

## Class I

Entomology No. (ENT-)	Item No.	Entomology No. (ENT-)	Item No.
38	33	24950-X (Monsanto CP-11901)	53
1716 (methoxychlor)	21	24951 (Monsanto CP-11447)	37
7422	50	24952 (Monsanto CP-12376)	36
8373	19	24953 (Monsanto CP-12432)	39
8374	20	24977 (Hercules AC-5199)	9
8379	18	24978 (Newphos No. 1)	41
9624 Dimite (R)	4	24980 (Chipman-6200)	43
13006	2	24984-X (Kryocide Super-Seventy)	47
15154 (Velsicol 48-CS-73)	27	25022-X (Monsanto CP-7768)	15
16519 (Aramite (R))	48	25257	51
16538 (ovex)	3	25274-X	29
17193	52	25525 (Velsicol 57-CS-41)	32
18066 (Dilan (R))	7	25568 (Bayer 24498)	42
18596 (chlorobenzilate)	5	25717 (Hooker HRS-1243)	28
20871 (sesamex)	1	25718 (Pentac (R))	6
21195	16	25732 (Hercules 8717)	13
23648 (Kelthane (R))	22	25758 (Stauffer B-8778)	38
23969 (carbaryl)	12	25766 (Zectran (R))	11
24044 (Monsanto CP-8574)	34	25767 (W-24 (Velsicol))	30
24415 (Monsanto CP-10502)	40	25784 (Bayer 44646)	10
24650-X (dimethoate)	44	25810 (Hercules 9699)	14
24653 (endothion)	46	25820 (Velsicol 58-CS-52)	45
24654 (Shell SD-4092)	17	26184	49
24695 (Monsanto CP-7769)	35	27002 (Velsicol 48-CS-34)	25
24728 (dimetan)	8	27004 (Velsicol 48-CS-36)	26
24832 (General Chemical GC-3661)	23	27054 (Hooker HB-8)	31
24833 (General Chemical GC-3707)	24		

## Class II

4221	63	23393 (Shell SD-2774)	65
4225 (TDE)	62	23394 (Shell SD-2801)	66
15153 (Velsicol 49-CS-53)	64	23979 (endosulfan)	67
17034 (malathion)	86	24105 (ethion)	80
17957 (Coumaphos)	83	24652 (American Cyanamide 18682)	78
19059 (Pyramat (R))	55	24689 (Bayer 23453)	82
19763 (trichlorfon)	71	24729 (Hercules 3895)	77
20738 (dichlorvos)	76	24941 (Bayer S 209 (22684))	75
20852 (butonate)	70	24949 (Monsanto CP-11549)	84
21557 (barthrin)	60	24954 (Monsanto CP-13206)	81
21825	61	24969 (Shell compound 4072)	74

## Class II

<u>Entomology No.</u> <u>(ENT-)</u>	<u>Item No.</u>	<u>Entomology No.</u> <u>(ENT-)</u>	<u>Item No.</u>
25540 (fenthion)	85	25763 (Hercules 7522H)	58
25661 (Stauffer R-2968)	54	25765 (Stauffer N-3051)	72
25705 (Imidan <sup>®</sup> )	79	25780 (Hooker HRS-1422)	56
25726 (Bayer 37344)	57	27001 (Velsicol 47-CS-116)	68
25736 (Upjohn U-17004)	59	27007 (Velsicol 52-CS-53)	69
25757 (Stauffer B-8760)	73		

## Class III

22377 (Shell 52-RL-71)	89	25635 (Bayer 30911)	102
23970 (Union Carbide UC-8305)	88	25712 (Bayer 37289)	98
24399 (Hercules 2032)	92	25713 (Bayer 38156)	97
24585 (Hercules 3004)	93	25715 (Bayer 41831)	100
24586 (Hercules 3653)	96	25754 (Stauffer N-2230)	99
24967 (General Chemical GC-3582)	95	25755 (Stauffer N-2404)	101
24968 (General Chemical GC-3583)	94	27006 (Velsicol 49-CS-51)	91
25500 (Union Carbide UC-10854)	87	27040 (Hooker HRS-1362)	90

## Class IV

8372	106	22376 (Shell 52-RL-45)	105
9932 (chlordane)	116	24880 (Telodrin <sup>®</sup> )	117
15150 (Velsicol 48-CS-99)	113	25562 (1-Fluorochlordene)	112
15152 (heptachlor)	114	25584 (Velsicol 53-CS-17)	108
15156 (Velsicol 52-CS-64)	107	25719 (mirex)	118
15949 (aldrin)	103	25960 (1-Bromochlordene)	111
16225 (dieldrin)	104	27003 (Velsicol 48-CS-35)	115
17713 (Velsicol 49-CS-56)	109	27005 (Velsicol 48-CS-104)	110



### USE PESTICIDES SAFELY

If you use pesticides, apply them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. If pesticides are handled or applied improperly, or if unused portions are disposed of improperly, they may be injurious to humans, domestic animals, desirable plants, honey bees and other pollinating insects, fish, and wildlife, and may contaminate water supplies.

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